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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,187	03/16/2001	Oded Gottesman	1279-316	6680

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EXAMINER	
LAO, TIM P	

ART UNIT	PAPER NUMBER
2655	6

DATE MAILED: 02/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/811,187	GOTTESMAN ET AL.	
	Examiner	**Art Unit**	
	Tim Lao	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12-35* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 14 is objected to because of the following informalities:

(a) The word "whithout" should be changed to -- without --.

(b) One of the two "the" words should be removed.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9, 12-16, and 25-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claims 9, 12-16, and 25-28, it is not clear what the parameter(s) and variable(s) in the mathematical formula(s) mean.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claimed invention lacks patentable utility.

Regarding claims 9, 12-16, and 25-28, the mathematical formula(s) represent abstract ideas or mathematical algorithms and therefore lack patentable utility.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-8, 10, 17-24, and 29-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Udaya Bhaskar et al. (U.S. Patent 6,493,664 B1).

Claim(s)	Udaya Bhaskar et al. disclose:
1	A method for interpolative coding (see Title and Abstract) input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or composed of a slowly evolving waveform (SEW) and a rapidly evolving waveform (REW) having a magnitude (col.4, L.29-31), (col.9, L.63-67; col.10, L.1-16) the method incorporating at least one of the following steps: (a) analysis-by-synthesis (AbS) vector quantization (VQ) of the rapidly evolving waveform parameter (e.g., the REW gain parameter); (col.11, L.8-12; col.26, L.16-67; col.27, L.1-42) *{§ 9.6.1 beginning on col.26, L.31 provides detailed description of REW gain quantization.}* (b) parametrizing (parametric representation of) the magnitude (i.e., spectral

magnitude) of the rapidly evolving waveform (i.e., the original REW magnitude vector); (col.11, L.8-21; col.5, L.5-16)

{1. The original REW magnitude vector is modeled using analytical functions. (col.8, L.27-30)

2. The original REW magnitude vector is converted to components comprising normalized REW magnitude shape vectors, i.e., sub-band vectors, which are modeled by a sub-band model (col.11, L.8-13). These REW sub-band vectors are to be quantized (col.11, L.15-18).

3. At the decoder, a full-dimensional REW magnitude shape vector, e.g., the vector that approximates the original REW magnitude vector, is obtained from the REW sub-band vector by piecewise-linear interpolation. (col.11, L.18-21; col.5, L.13-16)

4. Therefore, based on 1-3 above, the REW sub-band vectors are parametric representations of the original REW magnitude vector.}

(c) incorporating temporal weighting (temporal averaging, col.27, L.57-59) in the AbS VQ of the REW;

(d) incorporating spectral weighting in the AbS VQ of the REW; (col.28, L.43-65; col.18, L.38-46)

{The distortion measure between the coded REW magnitude shape sub-band vector and the original REW magnitude shape vector is spectrally weighted by $H_{wlpc}(M,k)$.}

(e) applying a filter (e.g., high pass filter) to a vector quantizer codebook in the analysis-bar-synthesis vector-quantization (VQ) of the rapidly evolving waveform (REW) whereby to add self correlation to the codebook vectors; (col.5, L.23-34) and

(f) using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform (REW) magnitude. (col.26, L.7-9)

{1. 5 bits are allocated for VQ of the REW gain component, e.g., the gain estimation error (col.5, L.17-22; col.27, L.1-11)

2. 6 bits are allocated for VQ of the REW magnitude shape component. (col.28, L.43-46)}

{Note:

The method disclosed here by Udaya Bhaskar et al. is by definition an Analysis-by-Synthesis (AbS) method because it comprises the steps of (i) parametric representations of the original (analytic) REW magnitude as stated in part (b) of claim 1 above; and (ii) distortion measure is computed to minimize the distortion between the coded REW vector and the original REW

	vector (col.28, L.43-65) as stated in part (c) of claim 1 above.}
Claim(s) 2	Udaya Bhaskar et al. disclose: The method of claim 1 further comprising analysis-by-synthesis vector quantization of the slowly evolving waveform (SEW). (col.11, L.38-40)
Claim(s) 3	Udaya Bhaskar et al. disclose: The method of claim 1 wherein said signal is speech. (Fig.1: 12; col.12, L.54-59)
Claim(s) 4	Udaya Bhaskar et al. disclose: The method of claim 1 wherein said method incorporates each of steps (a) through (c). Claim 4 is rejected on the same basis as for the rejection of claim 1.
Claim(s) 5	Udaya Bhaskar et al. disclose: A method for interpolative coding (see Title and Abstract) input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or composed of a slowly evolving waveform (SEW) and a rapidly evolving waveform (REW) having a magnitude (col.4, L.29-31), (col.9, L.63-67; col.10, L.1-16) comprising: (a) analysis-by-synthesis vector quantization of the rapidly evolving waveform parameter; (e.g., the REW gain parameter); (col.11, L.8-12; col.26, L.16-67; col.27, L.1-42) *{§ 9.6.1 beginning on col.26, L.31 provides detailed description of REW gain quantization.}* (b) analysis-by-synthesis quantization of the slowly evolving waveform (SEW); (col.11, L.38-40) (c) parametrizing (parametric representation of) the magnitude of the rapidly evolving waveform (i.e., the original REW magnitude vector); (col.11, L.8-21; col.5, L.5-16) *{The REW sub-band vectors are parametric representations of the original REW magnitude vector.}*

	(d) incorporating temporal weighting (temporal averaging, col.27, L.57-59) in the analysis-by-synthesis vector quantization of the rapidly evolving waveform (REW); and (e) incorporating spectral weighting in the analysis-by-synthesis vector quantization of the rapidly evolving waveform. (col.28, L.43-65; col.18, L.38-46) *{The distortion measure between the coded REW magnitude shape sub-band vector and the original REW magnitude shape vector is spectrally weighted by $H_{wlpc}(M,k)$.}* *{Note:* *The method disclosed here by Udaya Bhaskar et al. is by definition an Analysis-by-Synthesis (AbS) method because it comprises the steps of (i) parametric representations of the original (analytic) REW magnitude as stated in part (c) of claim 5 above; and (ii) distortion measure is computed to minimize the distortion between the coded REW vector and the original REW vector (col.28, L.43-65) as stated in part (e) of claim 5 above.}*
Claim(s) 6	Udaya Bhaskar et al. disclose: The method of claim 1 in which in the step of analysis-by-synthesis of a first (new) vector-quantization of the slowly evolving waveform (SEW) is predicted based on the vector quantization of the rapidly evolving waveform (REW) and a second (previous) vector quantization of the slowly evolving waveform (SEW). (col.26, L.31-46) *{1. Since PW gain is normalized to unity RMS value and since PW is the sum of SEW and REW (col.26, L.33-36), the SEW level is a unity complement of the REW level, i.e., SEW level = 1 – REW level, or vice versa (col.26, L.36-37).* *2. a new SEW (predicted) level can be predicted based on unity complement of previously calculated REW level (i.e., eq.9.6.5 in col.26, L.64), where this previously calculated REW level is computed from the previously calculated SEW level (i.e., eq.9.6.4 in col.26, L.59).}*
Claim(s) 7	Udaya Bhaskar et al. disclose: A method for interpolative coding (see Title and Abstract) input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or composed of a rapidly evolving waveform (REW), (col.9, L.63-67; col.10, L.1-16)

	the method incorporating analysis-by-synthesis vector quantization of the rapidly evolving waveform parameter (e.g., the REW gain parameter). (col.26, L.31-46)
Claim(s) 8	Udaya Bhaskar et al. disclose: A method for interpolative coding (see Title and Abstract) input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or composed of a slowly evolving waveform (SEW) and a rapidly evolving waveform (REW) having a magnitude (col.4, L.29-31), (col.9, L.63-67; col.10, L.1-16) comprising: parametrizing (parametric representation of) the magnitude of the rapidly evolving waveform (i.e., the original REW magnitude vector). (col.11, L.8-21; col.5, L.5-16) *{The REW sub-band vectors are parametric representations of the original REW magnitude vector.}*
Claim(s) 10	Udaya Bhaskar et al. disclose: A method for interpolative coding (see Title and Abstract) input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or composed of a rapidly evolving waveform (REW), (col.9, L.63-67; col.10, L.1-16) comprising: using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform (REW) magnitude. (col.26, L.7-9) *{1. 5 bits are allocated for VQ of the REW gain component, e.g., the gain estimation error (col.5, L.17-22; col.27, L.1-11)* *2. 6 bits are allocated for VQ of the REW magnitude shape component. (col.28, L.43-46)}*
Claim(s) 17	Udaya Bhaskar et al. disclose: A method for vector quantization of set of vectors (sub-band vectors), (col.11, L.8-21) using parametrization of each vector in the set, and (col.11, L.8-21) *{Each REW sub-band vector is a parametric representation of the original REW magnitude vector.}*

	applying vector quantization to the vector of parameters. (col.11, L.15-18; col.28, L.43-46)
Claim(s) 18	Udaya Bhaskar et al. disclose: The method of claim 17 using weighted distortion. (col.28, L.59-60)
Claim(s) 19	Udaya Bhaskar et al. disclose: A method for dual (or higher order) prediction of vectors. (col.26, L.31-46) *{The method described in col.26, L.31-46 can be interpreted as a method of higher order prediction of vectors (i.e., SEW gain vectors), that is, SEW level can be predicted based on unity complement of previously calculated REW level (i.e., eq.9.6.5 in col.26, L.64), which is computed from the previously calculated SEW level (i.e., eq.9.6.4 in col.26, L.59).}*
Claim(s) 20	Udaya Bhaskar et al. disclose: A method for dual (or higher order) predictive coding of vectors. (col.26, L.31-46) *{The method described in col.26, L.31-46 can be interpreted as a method of higher order predictive coding of vectors (i.e., SEW gain vectors), that is, SEW level can be predicted based on unity complement of previously calculated REW level (i.e., eq.9.6.5 in col.26, L.64), which is computed from the previously calculated SEW level (i.e., eq.9.6.4 in col.26, L.59).}*
Claim(s) 21	Udaya Bhaskar et al. disclose: The method of claim 19 using Analysis-by-Synthesis. *{The method disclosed here by Udaya Bhaskar et al. is by definition an Analysis-by-Synthesis method as explained in the reasons for the rejection of claim 1.}*
Claim(s) 22	Udaya Bhaskar et al. disclose: A method for predicting the slowly evolving waveform (new SEW) from both rapidly evolving waveform (previous REW) and past slowly evolving waveform data (previous REW). (col.26, L.31-46) *{1. Since PW gain is normalized to unity RMS value and since PW is the sum of SEW and*

	REW (col.26, L.33-36), the SEW level is a unity complement of the REW level, i.e., SEW level = 1 – REW level, or vice versa (col.26, L.36-37). *2. a new SEW (predicted) level can be predicted based on unity complement of previously calculated REW level (i.e., eq.9.6.5 in col.26, L.64), where this previously calculated REW level is computed from the previously calculated SEW level (i.e., eq.9.6.4 in col.26, L.59).}*
Claim(s) 23	Udaya Bhaskar et al. disclose: A method for predictive coding of the slowly evolving waveform using both rapidly evolving waveform based prediction and past slowly evolving waveform prediction. (col.26, L.31-46)
Claim(s) 24	Udaya Bhaskar et al. disclose: A method of using codebooks (e.g., for VQ) for each sub-range in subdivided parameter range (e.g., pitch range, col.41, L.27-28; voice measure range, col.42, L.26-27; REW sub-bands, col.27, L.61-65) in order to improve coding efficiency (col.1, L.31-34). *{Pitch range is encoded using 7 bits (col.41, L.27-28). Voice measure range is encoded using 3 bits (col.42, L.26-27). REW sub-bands are encoded using 6 bits (col.28, L.43-46).}*
Claim(s) 29	Udaya Bhaskar et al. disclose: A speech coding system (see Title and Abstract) using waveform interpolation comprising at least one of the following steps: (a) analysis-by-synthesis vector quantization of a rapidly evolving waveform parameter (e.g., the REW gain parameter); (col.11, L.8-12; col.26, L.16-67; col.27, L.1-42) *{§ 9.6.1 beginning on col.26, L.31 provides detailed description of REW gain quantization.}* (b) parametrizing (parametric representation of) a magnitude (i.e., spectral magnitude) of a rapidly evolving waveform (i.e., the original REW magnitude vector); (col.11, L.8-21; col.5, L.5-16) *{The REW sub-band vectors are parametric representations of the original REW magnitude vector as explained in part (b) of claim 1.}*

	(c) incorporating temporal weighting (temporal averaging, col.27, L.57-59) in the AbS VQ of the REW; (d) incorporating spectral weighting in the AbS VQ of the REW; (col.28, L.43-65; col.18, L.38-46) *{The distortion measure between the coded REW magnitude shape sub-band vector and the original REW magnitude shape vector is spectrally weighted by $H_{wlpc}(M,k)$.}* (e) applying a filter to a vector quantizer codebook in the analysis-by-synthesis vector-quantization of the rapidly evolving waveform (REW) whereby to add self correlation to the codebook vectors; (col.5, L.23-34) and (f) using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform (REW) magnitude. (col.26, L.7-9) *{1. 5 bits are allocated for VQ of the REW gain component, e.g., the gain estimation error (col.5, L.17-22; col.27, L.1-11) 2. 6 bits are allocated for VQ of the REW magnitude shape component. (col.28, L.43-46)}*
Claim(s) 30	Udaya Bhaskar et al. disclose: A speech coding system (see Title and Abstract) using waveform interpolation comprising: (a) analysis-by-synthesis vector quantization of a rapidly evolving waveform parameter (e.g., the REW gain parameter); (col.11, L.8-12; col.26, L.16-67; col.27, L.1-42) *{§ 9.6.1 beginning on col.26, L.31 provides detailed description of REW gain quantization.}* (b) analysis-by-synthesis quantization of the slowly evolving waveform (SEW); (col.11, L.38-40) (c) parametrizing (parametric representation of) a magnitude (i.e., spectral magnitude) of the rapidly evolving waveform (i.e., the original REW magnitude vector); (col.11, L.8-21; col.5, L.5-16) *{The REW sub-band vectors are parametric representations of the original REW magnitude vector as explained in part (b) of claim 1.}*

	(d) incorporating temporal weighting (temporal averaging, col.27, L.57-59) in the analysis-by-synthesis vector quantization of the rapidly evolving waveform (REW); and (e) incorporating spectral weighting in the analysis-by-synthesis vector quantization of the rapidly evolving waveform (REW). (col.28, L.43-65; col.18, L.38-46) *{The distortion measure between the coded REW magnitude shape sub-band vector and the original REW magnitude shape vector is spectrally weighted by $H_{wlpc}(M,k)$.}*
Claim(s) 31	Udaya Bhaskar et al. disclose: A speech coding system (see Title and Abstract) using waveform interpolation of input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or composed of a rapidly evolving waveform (REW), (col.9, L.63-67; col.10, L.1-16) comprising: incorporating analysis-by-synthesis vector quantization of the rapidly evolving waveform parameter (e.g., the REW gain parameter). (col.26, L.31-46)
Claim(s) 32	Udaya Bhaskar et al. disclose: A speech coding system (see Title and Abstract) using waveform interpolation of input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or composed of a slowly evolving waveform (SEW) and a rapidly evolving waveform (REW) having a magnitude (col.4, L.29-31), (col.9, L.63-67; col.10, L.1-16) comprising: parametrizing (parametric representation of) the magnitude (i.e., spectral magnitude) of the rapidly evolving waveform (i.e., the original REW magnitude vector). (col.11, L.8-21; col.5, L.5-16) *{The REW sub-band vectors are parametric representations of the original REW magnitude vector as explained in part (b) of claim 1.}*
Claim(s) 33	Udaya Bhaskar et al. disclose: A speech coding system (see Title and Abstract) using waveform interpolation of input signals (e.g., prototype waveform (PW)), said signals (PW) decomposed into or

	composed of a rapidly evolving waveform (SEW), (col.9, L.63-67; col.10, L.1-16) comprising: using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform (REW) magnitude. (col.26, L.7-9) *{1. 5 bits are allocated for VQ of the REW gain component, e.g., the gain estimation error (col.5, L.17-22; col.27, L.1-11)* *2. 6 bits are allocated for VQ of the REW magnitude shape component. (col.28, L.43-46)}*
Claim(s) 34	Udaya Bhaskar et al. disclose: A speech coding system (see Title and Abstract) using waveform interpolation comprising dual or higher order prediction of vectors. (col.26, L.31-46)
Claim(s) 35	Udaya Bhaskar et al. disclose: A speech coding system (see Title and Abstract) using waveform interpolation comprising dual or higher order predictive coding of vectors. (col.26, L.31-46)

Allowable Subject Matter

8. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Claim(s) 11	The prior art fails to show: The method of claim 10 in which 7 bits are allocated to the rapidly evolving waveform magnitude in the coder.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Documents:

[1] 5,517,595 05/1996 Kleijn

Other Documents:

[2] U. Bhaskar et al., "Quantization of SEW and REW components for 3.6 kbits/s coding based on PWI," IEEE Workshop on Speech Coding Proceedings, pp.99-101, Jun. 1999.

[3] D.H. Pham et al., "Quantisation techniques for prototype waveforms," Fourth International Symposium on Signal Processing and Its Applications '96, vol.1, pp.53-56, Aug. 1996.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Lao whose telephone number is 703-305-8955. The examiner can normally be reached on M-F, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-305-9508.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9000.

Tim Lao
Examiner
Art Unit 2655

TL
02/06/04

Doris To

DORIS H. TO 2/20/04
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600